Fuel Property comparison

	NExBTL	GTL	FAME (RME)	Sulfur free Diesel fuel (summer)
Density at +15°C (kg/m^3)	775 ... 785	770 ... 785	≈ 885	≈ 835
Viscosity at +40°C (mm^2/s)	2.9 ... 3.5	3.2 ... 4.5	≈ 4.5	≈ 3.5
Cetane number	≈ 84 ... 99 *	≈ 73 ... 81	≈ 51	≈ 53**
Cloud point (°C)	≈ - 5 ... - 30	≈ 0 ... - 25	≈ - 5	≈ - 5
Heating value (lower) (MJ/kg)	≈ 44	≈ 43	≈ 38	≈ 43
Heating value (MJ/l)	≈ 34	≈ 34	≈ 34	≈ 36
Polyaromatic content (wt-%)	0	0	0	≈ 4
Oxygen content (wt-%)	0	0	≈ 11	0
Sulfur content (mg/kg)	< 10 (< 1)	< 10	< 10	< 10
Carbon / hydrogen	≈ 5.6	≈ 5.6		≈ 6.0

*) Blending cetane number
**) ASTM specification > 40

6 2006-03-09 A 2nd Opinion, Inc. For Neste Oil

U.S. National Institute of Standards and Technology (NIST)

Fossil fuels

- **Barrel of oil** equivalent (boe) = approx. 6.1 GJ (5.8 million Btu), equivalent to 1,700 kWh. "Petroleum barrel" is a liquid measure equal to 42 U.S. gallons (35 Imperial gallons or 159 liters); about 7.2 barrels oil are equivalent to one tonne of oil (metric) = 42 -45 GJ.
- **Gasoline:** US gallon = 115,000 Btu = 121 MJ = 32 MJ/liter (LHV). HHV = 125,000 Btu/gallon = 132 MJ/gallon = 35 MJ/liter
  - Metric tonne gasoline = 8.53 barrels = 1356 liter = 43.5 GJ/t (LHV); 47.3 GJ/t (HHV)
  - gasoline density (average) = 0.73 g/ml (= metric tonnes/m ^{3})
- **Petro-diesel** = 130,500 Btu/gallon (36.4 MJ/liter or 42.8 GJ/t)
  - petro-diesel density (average) = 0.84 g/ml (= metric tonnes/m ^{3})
- Note that the energy content (heating value) of petroleum products per unit mass is fairly constant, but their density differs significantly – hence the energy content of a liter, gallon, etc. varies between gasoline, diesel, kerosene.
- Metric tonne **coal** = 27-30 GJ (bituminous/anthracite); 15-19 GJ (lignite/sub-bituminous) (the above ranges are equivalent to 11,500-13,000 Btu/lb and 6,500-8,200 Btu/lb).
  - Note that the energy content (heating value) per unit mas s varies greatly between different "ranks" of coal. "Typical" coal (rank not specified) usually means bituminous coal, the most common fuel for power plants (27 GJ/t).

- **Natural gas:** HHV = 1027 Btu/ft3 = 38.3 MJ/m^3; LHV = 930 Btu/ft3 = 34.6 MJ/m^3
    - Therm (used for natural gas, methane) = 100,000 Btu (= 105.5 MJ)

Carbon content of fossil fuels and bioenergy feedstocks

- **coal** (average) = 25.4 metric tonnes carbon per terajoule (TJ)
    - 1.0 metric tonne **coal** = 746 kg carbon
- **oil** (average) = 19.9 metric tonnes carbon / TJ
- 1.0 US gallon **gasoline** (0.833 Imperial gallon, 3.79 liter) = 2.42 kg carbon
- 1.0 US gallon **diesel/fuel oil** (0.833 Imperial gallon, 3.79 liter) = 2.77 kg carbon
- **natural gas (methane)** = 14.4 metric tonnes carbon / TJ
- 1.0 cubic meter **natural gas (methane)** = 0.49 kg carbon
- carbon content of **bioenergy feedstocks:** approx. 50% for woody crops or wood waste; approx. 45% for graminaceous (grass) crops or agricultural residues

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